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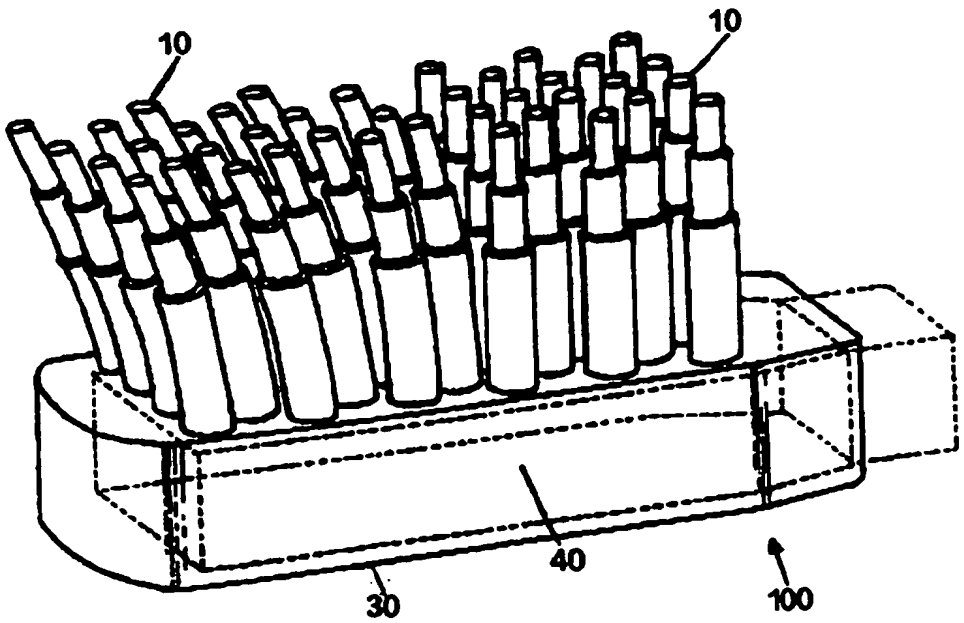

(57) Abstract

"Multifunctional bristle" means that said bristle simultaneously effects several actions. In particular, this is obtained by giving to said bristle a suitable shape. The anti-traumatic multifunctional bristle (10, 20) object of the present invention is characterized by the fact that it presents a step structure, wherein said step structure can consist of a plurality of cylinders (11, 12, 13) or cones (21, 22, 23).

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ANTI-TRAUMATIC MULTIFUNCTIONAL BRISTLE

State of the art and summary of the invention

Toothbrush bristles are usually traumatic on teeth and gums, though being quite effective against the dental plaque, causing micro-lesions on the dental enamel whereon more plaque adheres. In a long-term while this fact causes gengivitis and irreversible damages to the dental structure.

Since they use very thin threads, present toothbrushes employ very hard bristles made of syntetic or natural material in order to have a sufficient consistency.

Some toothbrushes presenting a non-traditional shape have bristles obtained by an injection moulding; however, because of their shape and scarce efficiency, they produce more damages than the traditional ones. Furthermore, they have less effective action on the bacteric plaque, not allowing the adequate movement required by the specific dental structure (each person has different needs according to his/her own problems), and also because the bristles (generally shorter than the traditional ones) of these toothbrushes damage the gums with their low flexibility.

Anyway, the prior art bristles are not anti-traumatic and multifunctional as claimed for those of the invention described in the following.

In the present specification, the term "multifunctional bristle" means that said bristle simultaneously effects several actions. In particular, this is obtained by giving to said bristl a suitable shape.

The anti-traumatic multifunctional bristle object of the present invention is characterized by the fact that it presents a step structure, wherein said step structure can consist of a plurality of cylinders or frustums of cone.

In order to improve the removal action performed by a head, e.g. an extractable head, it is also possible to provide said head with bristles presenting various roughnesses, and/or various edges, and/or various rulings, and/or irregular geometrical shapes, and/or a rectangular or triangular shape, and/or at least one threaded screw.

The bristles according to the present invention can be made of a hydro-repellent material, e. g. polyethylene or similar by-products, or gummy material, or silicone rubber. The claimed bristles can be built up by means of an injection moulding process.

It is also claimed the use of said bristles on an extractable head for toothbrush. In particular, the extractable head can be mounted on electronic toothbrush devices.

List of the alleged figures

Various other objects, features and advantages of the pres nt invention will be more fully appreciated from the following detailed description of the preferred embodiments, when considered in connection with the accompanying drawings, wherein:

figure 1 shows a side view of a first embodiment of the bristle object of the present invention;

figure 2 shows a top view of the bristle of figure 1;

figur 3 shows a side view of a second embodiment of the bristle object of the pr sent inv ntion;

figure 4 shows a top view of th bristle of figure 3;

figure 5 shows an extractable head for toothbrush using a plurality of bristles according to the first embodiment shown in figures 1 and 2.

Detailed description of the invention

The term "anti-traumatic multifunctional bristle" used in the present specification refers to the shape and the consistency of said bristle due to the use of non-traumatic materials, such as polyethylene or similar by-products having low or high density.

The first embodiment shown in figures 1, 2 refers to a bristle composed of a plurality of cylinders having different diametres In particular, bristle 10 consists of a plurality of cylinders 11, 12, 13. The larger the distance from the base 14, the smaller the cylinder diameter.

Figures 3, 4 show a second embodiment of the present invention, wherein the bristle 20 consists of a plurality of frustums of cone 21, 22, 23. Likewise, the larger the distance from the base 24, the smaller the cone diameters.

In these two embodiments it is not the single bristle which works, but each concentric section of the bristle itself.

In addition to the superimposed cylinders or frustums of cone, roughnesses, and/or various edges, and/or various rulings, and/or irregular geometrical shapes, and/or a rectangular or triangular shape, and/or at least one threaded screw (not shown in the alleged figures) can be provided.

The bristles according to the present invention can be made of a hydro-repellent material, e. g. polyethylene or similar by-products, or gummy material, or silicone rubber. The claimed bristles can be built up by means of an injection moulding process.

A very important aspect, which is different from the traditional bristles, is due to the fact that the user can determine the hardness of the bristle section to be used by more or less pressing the bristles against the cleaning part. Thus, bristles having a controlled action can be obtained. It is obvious that the thin top section of the bristle does not traumatize the gums by performing the gingival massage. Therefore, if the user exerts less pressure, he does not traumatize the gums, whereas traditional bristles traumatize them even by a simple skimming because of their hardness.

The tidy bristle disposition as well as their special material, e.g. water-repellent polyethylene, allow a better cleaning of the toothbrush, e. g. with a treatment with hot water for 3 minutes. A further advantage of the bristle is due to the elasticity of the used materials.

Said bristles are multifunctional due to the following simultaneous actions:

1) Elastic action : it depends on the material; the bristles generally return to the starting position after the action.

2) Vibrating action : the bristles are disposed so that, moving together, they vibrate on the part to be cleaned.

3) Sussultatory action : the bristles present a concentric cylindrical or frusto-conical shape; therefore, each section slightly jumps when the toothbrush glides on the teeth or on the gums, thus creating a sussultatory movement.

4) R -sussultatory action : during the gliding on the part to be cl an d, the lower part of the concentric frustums of cone having greater consist ncy creates a further stronger sussultatory movement

which can be defined a "re-sussultatory action".

5) Sliding and removal action : it depends on the kind of material and is based on the principle that when two bodies scrape on each other, the harder removes the softer. It should be noted that the used material is harder than the plaque and softer than the dental enamel, i.e. it is different from traditional bristles, which are harder than plaque, dental enamel and gums.

Only one of the aforesaid actions is nowadays used, i.e. the removal action due to the bristle consistency, but not to its shape, which is smooth. Therefore, if said bristles have to be effective, they must be very hard and, as a consequence of this fact, very traumatizing.

Figure 5 shows an extractable head 100 consisting of a main body 30 which supports a plurality of bristles 10 (in this figure the bristles 10 are partially deformed). Inside the main body 30 a cavity 40 is provided in order to receive the handle (not shown) of the toothbrush. The plurality of bristles 10 and the main body 30 can be obtained with only one moulding operation.

It should be understood that several modifications may be made in the specific form of the invention shown in the drawings and described above without deviating from the broader aspects of the invention.

CLAIMS

1. An anti-traumatic multifunctional bristle (10, 20) characterized by the fact that it presents a step structure.

2. Bristle according to claim 1, wherein said step structure consists of a plurality of cylinders (11, 12, 13) or frustums of cone (21, 22, 23).

3. Bristle according to claim 1, wherein said step structure presents various surface roughnesses.

4. Bristle according to claim 1, wherein said step structure presents various edges.

5. Bristle according to claim 1, wherein said step structure pres nts various rulings.

6. Bristle according to claim 1, wherein said step structure presents an irregular geometrical shape.

7. Bristle according to claim 1, wherein said step structure has a rectangular or triangular shape.

8. Bristle according to claim 1, wherein said step structure pres nts on its surface at least one threaded screw.

9. Bristle according to claim 1, made of a hydro-repellent material.

10. Bristle according to claim 9, wherein said hydro-repellent material is polyethylene or similar by-products.

11. Bristle according to claim 9, wherein said hydro-repellent material is a gummy material.

12. Bristle according to claim 9, wherein said hydro-repellent mat rial is silicone rubber.

13. Bristle according to claim 1, built up by means of an injection moulding process.

14. Bristle according to claim 1, placed on an extractable head (100) for toothbrush.

15. Bristle according to claim 1, mounted on electronic toothbrush devices.

16. Bristle according to claim 1, having one or more than one of the features claimed in claims 1-14.

17. An extractable head (100) for toothbrush presenting a plurality of bristles (10, 20) as claimed in claim 16.

18. Extractable head (100) according to claim 17, presenting a cavity (40) in order to provide its coupling with a handle.

19. A toothbrush using an extractable head (100) as per claim 17.

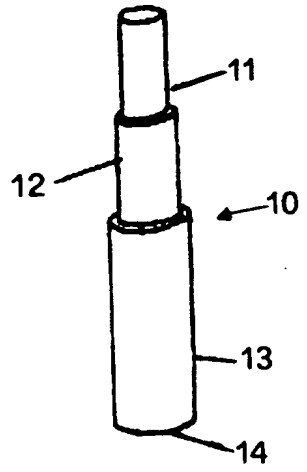


FIG. 1

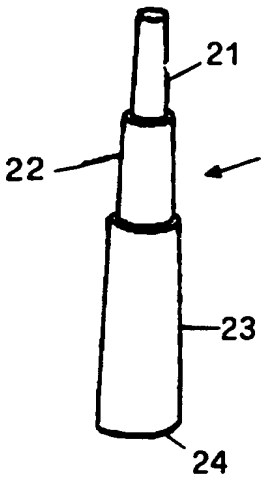
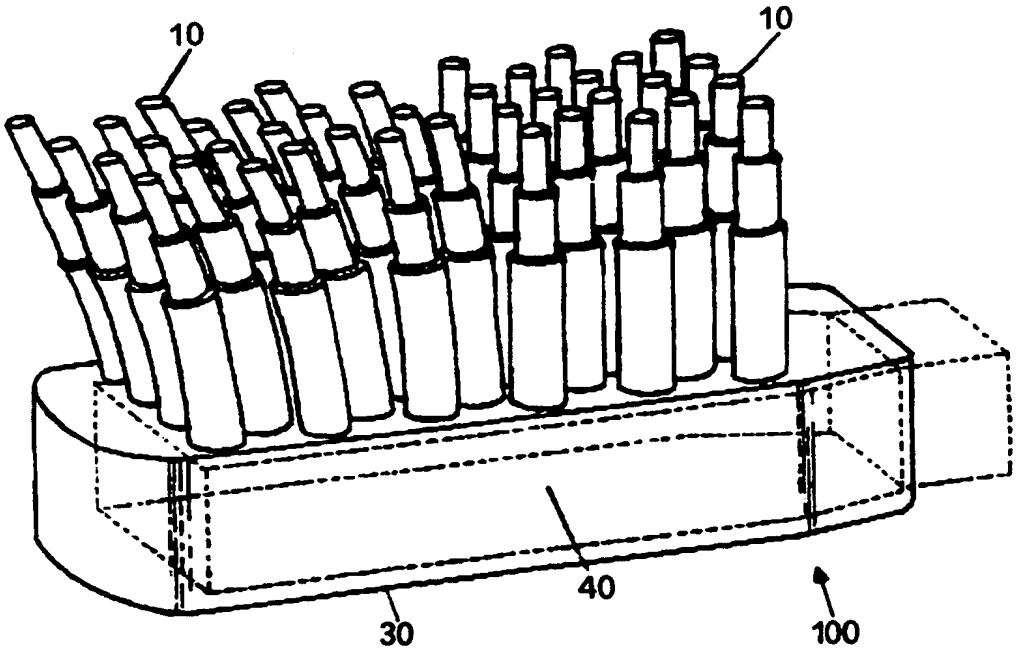


FIG. 3

FIG. 2

FIG. 4

FIG. 5



INTERNATIONAL SEARCH REPORT

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PCT/EP 95/03830

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A46D1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A46D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE,U,90 12 603 (CORONET-WERKE HEINRICH SCHLERF) 9 January 1992 see page 3, paragraph 3 - page 4, paragraph 1; claim 1; figures ---	1,17,19
A	DE,B,11 85 574 (SOCIÖTÖ RHODIACETA) 21 January 1965 see the whole document ---	1,17,19
A	GB,A,1 098 357 (LEWIS) 10 January 1968 see page 2, line 113 - page 4, line 112; figures ---	1,17,19
A	US,A,4 565 205 (TAYLOR) 21 January 1986 see claims; figures --- -/--	1,17,19

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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A	US,A,4 307 478 (WARD ET AL.) 29 December 1981 see claims; figures	1,17,19

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Information on patent family members

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DE-U-9012603	09-01-92	NONE	
DE-B-1185574		NONE	
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